

## COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

The following table provides commercial turf and golf course insect control recommendations with pesticides for use by professional applicators.

All chemical information provided below is given with the understanding that no endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insecticides listed below are identified by common chemical name. A trade name in parentheses may also be listed as a convenience for the reader.

Pests	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
<b>Ant</b>	bifenthrin* (Menace, Talstar, others) F, GC and G form also available	0.5-1 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3 fl oz 2.5-5 lb/acre	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	clothianidin + bifenthrin (Aloft)	see label	
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	
	cyfluthrin (Tempo 2)	0.143 fl oz	Home lawns only.
	cypermethrin* (Demon) TC	see label	
	deltamethrin (DeltaGard) G	2-3 lb	
	fipronil (bait)	see label	
hydramethylnon* (Maxforce G, Amdro)	see label		
λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.	
<b>Ant, Red Imported Fire</b>	Treatment is required to ship sod from quarantined to non-quarantined areas. Consult the Arkansas State Plant Board and USDA Program Aid No. 1822, "Imported Fire Ant 2007: Quarantine Treatments for Nursery Stock and Other Regulated Articles," for all rules and regulations pertaining to the Federal Imported Fire Ant quarantine and treatment requirements. <b>The following insecticides are authorized by USDA for the treatment of regulated articles under the Imported Fire Ant (IFA) quarantine: chlorpyrifos, fipronil.</b>		
	<b>Apply all bait products when ants are active and soil temperature is above 60 degrees F. Do not treat if rain is anticipated within 6 hours.</b>		
	abamectin* (Ascend, Varsity) 0.011% bait	5-7 Tbsp/mound  1 lb/acre	Individual mound treatment rate. Distribute uniformly 5 to 7 level tbsp of bait 2 to 4 ft around base of each mound. Broadcast rate
	acephate* (Lesco-Fate) (Orthene T, T&O) 75 S (Ortho Orthene Fire Ant Killer1) 50 S (Precise 4G)	see label 1-2 tsp/mound 1 Tbsp/mound see label	Distribute uniformly over mound. For best results, apply early in morning or late afternoon.
	chlorpyrifos (Dursban Pro)	1.5 fl oz 2 fl oz/4 gal of water	Single mound treatment ONLY.
	clothianidin + bifenthrin (Aloft)	see label	
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	

\*Several trade names available. Check label for active ingredient. Always follow label instructions.

**COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL**

<b>Pests</b>	<b>Insecticide and Formulation</b>	<b>Amount Per 1,000 Square Feet</b>	<b>Comments/Precautions</b>	
<b>Ant, Red Imported Fire (cont.)</b>	fenoxy carb (Award)	1-3 Tbsp/mound 1-1.5 lb/acre	Single-mound treatment rate Broadcast rate This is an insect growth regulator (IGR).	
	fipronil (Chipco Firestar, Ceasefire) fire ant bait	5 Tbsp/mound 1.5-15 lb/acre see label	Single-mound treatment rate Broadcast rate Apply as a broadcast. May treat up to 4 times per year.	
	(Maxforce FC 0.00045%) (Top Choice 0.0143%) granular contact insecticide	87 lb/acre	Broadcast only	
	(Chipco Choice) 0.1% granular contact insecticide	12.5 lb/acre	Broadcast only The fipronil products have the same active ingredient but are different formulations; read and follow the label.	
	hydramethylnon (Amdro, Amdro Pro, MaxForce Fire Ant Granular Bait)	2-5 Tbsp/mound 2 lb/acre	Single-mound treatment rate Broadcast rate	
	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.	
	indoxacarb (Advion) fire ant bait 0.045%	4 Tbsp/mound 1.5 lb/acre	Do not apply to top of mound. Distribute uniformly 3 to 4 feet around mound. Broadcast rate	
	pyrethroids (various) bifenthrin (Menace, Talstar, others) F and G forms also available cyfluthrin (Tempo) deltamethrin (Deltagard G) λ-cyhalothrin (Battle, Scimitar CS, GC) permethrin (various)	see label		
	pyriproxyfen (Distance)	1-4 Tbsp/mound 1-1.5 lb/acre	Single-mound treatment rate Broadcast rate This is an IGR.	
	S-methoprene (Extinguish)	3-5 Tbsp/mound 1-1.5 lb/acre	Single-mound treatment rate Broadcast rate This is an IGR.	
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1-1.5 lb/acre	Single-mound treatment rate Broadcast rate This is an IGR plus a toxicant.	
	spinosad (Eliminator Fire Ant Bait, Justice Fire Ant Bait, Ortho Fire Ant Bait)	4-6 Tbsp/mound 2.5-5 lb/acre	Single-mound treatment rate Broadcast rate	
	<b>Bee and Wasp (Burrowing)</b>	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	2.5 fl oz /gal 1 pack/13.3 gal	
		pyrethroids (Advanced Garden, Battle, Deltagard, Menace, Scimitar, Talstar, Tempo)	see label	
<b>Billbug</b>	bifenthrin* (Menace, Talstar, others) F, GC and G form also available	0.25-0.5 fl oz	Use GC formulation for golf courses.	
	chlorantraniliprole (Acelepryn)	0.184-0.46 fl oz		
	chlorpyrifos* (Dursban Pro)	1.5 fl oz		

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<b>Billbug</b>	clothianidin (Arena) 0.25 G, 50 WDG	see label	
	clothianidin + bifenthrin (Aloft)	see label	
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	
	deltamethrin (Deltagard) G	2-3 lb	
	imidacloprid* (Merit) 75 WSP	3-4 level tsp	Make application prior to egg hatch.
	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Observe restrictions near water.
	thiamethoxam (Meridian)		Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	0.33 G 25 WG	60-80 lb/acre 12.7-17 oz/acre	
<b>Chinch Bug</b>	acephate* (Orthene T, T&O) 75 S	1.2-2.4 oz	
	<i>Beauveria bassiana</i> (Botanigard, Naturalis-T)	see label	
	bifenthrin* (Menace, Talstar, others) F, GC and G form also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	4.4-6.0 fl oz 7.5-10 lb/acre	
	chlorantraniliprole (Acelepryn)	0.184-0.46 fl oz	Suppression.
	clothianidin (Arena) 0.25 G, 50 WDG	see label	
	clothianidin + bifenthrin (Aloft)	see label	
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	
	cypermethrin (Demon) TC	0.33-0.65 fl oz	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	cyfluthrin (Tempo 2)	0.2 fl oz	Home lawns only.
	deltamethrin (Deltagard) G	2-3 lb	
imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.	
λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.	
permethrin* (Astro)	0.4-0.8 fl oz		
<b>Cutworm, Armyworm</b>	acephate* (Orthene T, T&O)	1.2-2.4 oz	Commercial and residential turf only.
	azadirachtin* (Neemix, Turplex)	see label	
	bifenthrin* (Menace, Talstar, others) F, GC and G form also available	0.18-0.25 fl oz	Use GC formulation for golf courses.
	<i>Bt</i> products (various labels)	see label	
	carbaryl* baits	0.75-1.5 oz	Treat in late afternoon. Apply in adequate water for good coverage but do not flood or water in. Do not cut grass for one to three days after treatment.

\*Several trade names available. Check label for active ingredient. Always follow label instructions.

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<b>Pests</b>	<b>Insecticide and Formulation</b>	<b>Amount Per 1,000 Square Feet</b>	<b>Comments/Precautions</b>
<b>Cutworm, Armyworm (cont.)</b>	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	clothianidin (Arena) 0.25 G, 50 WDG	see label	Cutworms only
	clothianidin + bifenthrin (Aloft)	see label	
	cyfluthrin* (Tempo 2)	0.143 fl oz	Home lawns only.
	deltamethrin (Deltagard) G	2-3 lb	
	entomogenous nematodes*	see label	Read and follow special application instructions. Effective only against small cutworms.
	halofenozide* (Mach 2) 2 SC	1.5 fl oz	Can be used two times per season at these rates.
	1.5 G	1 lb	
	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Provaunt) WDG	see label	Not labeled for use on sod farms.
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.
spinosad A or D (Conserve) SC	0.25-1.25 fl oz	Rate varies with size and species.	
trichlorfon (Dylox 80 SP)	1.5-3.0 oz		
<b>Earthworm</b>			Usually not a problem. No effective controls available.
<b>Eriophyid Mites (Zoysiagrass mite and bermudagrass stunt mite)</b>	azadirachtin (Azatrol)	see label	Registered for use on eriophyid mites in turfgrass.
	bifenthrin (Allectus GC SC, Bifenthrin 2EC, Quali-Pro Bifenthrin, Talstar F)	see label	Registered for use on eriophyid mites in turfgrass.
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	deltamethrin (DeltaGard T&O 5SC)	see label	Registered for use on eriophyid mites in turfgrass.
	dicofof (Kelthane 50 WSP)	see label	Registered for use on sod farms and golf courses for eriophyid mite control. NOT registered for use on residential turf.
λ-cyhalothrin (Quali-Pro Lambda GC-O, Scimitar)	see label	Registered for use on eriophyid mites in turfgrass.	
<b>Fall Armyworm</b>	acephate* (Orthene T, T&O)	0.5-1.2 oz	Water in immediately after application.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	halofenozide* (Mach 2) 2 SC	1.5 fl oz	Can be used two times per season at these rates.
	1.5 G	1 lb	
	indoxacarb (Provaunt) WDG	see label	Not labeled for use on sod farms.
	pyrethroids* (Advanced Garden, Battle, Deltagard, Menace, Scimitar, Talstar, Tempo)	see label	

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Pests	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
<b>Grasshopper</b>	acephate* (Orthene T, T&O)	0.5 oz	Do not mow turfgrass for at least 24 hours after application.
	carbaryl* (Carbaryl 4L Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	deltamethrin (Deltagard) G	2-3 lb	
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	
<b>Ground Pearl</b>			No effective control; practice good management.
<b>Grub (White, May Beetle, Chafers, Green June Beetle, and Others)</b>	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	6 fl oz 10 lb/acre	Optimal control when applied at egg hatch. Use higher rates later in summer.
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz	
	clothianidin (Arena) 0.25 G, 50 WDG	see label	
	clothianidin + bifenthrin (Aloft)	see label	Apply during egg hatch or early instar grub development.
	halofenozide* (Grubex, Mach 2) 2 SC 1.5 G	2.9 fl oz 3 lb	
	imidacloprid* (Merit) 75 WP	3-4 level tsp	Make application prior to egg hatch. (Offers some suppression of caterpillars.) Rate varies with pest. Different formulations for different sites.
	imidacloprid + bifenthrin (Allectus, Atera)	see label	
	thiamethoxam (Meridian) 0.33 G 25 WG	60-80 lb/acre 12.7-17 oz/acre	Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	trichlorfon (Dylox 80 SP)	3.75 oz	
	<b>Grub, Green June Beetle (only)</b>	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5 lb/acre
chlorantraniliprole (Acelepryn)		0.184-0.367 fl oz	
chlorpyrifos* (Dursban Pro)		1.5 fl oz	For use on turfgrasses and golf courses. See new label.
clothianidin (Arena) 0.25 G, 50 WDG		see label	
clothianidin + bifenthrin (Aloft)		see label	
halofenozide* (Grubex, Mach 2) 2 SC 1.5 G		2.9 fl oz 3 lb	Apply during egg hatch or early instar grub development.
imidacloprid* (Merit) 75 WP		3-4 level tsp	
imidacloprid + bifenthrin (Allectus, Atera)		see label	Make application prior to egg hatch. Do not use on sod farms. (Offers some suppression of caterpillars.) Rate varies with pest. Different formulations for different sites.
thiamethoxam (Meridian) 0.33 G 25 WG		60-80 lb/acre 12.7-17 oz/acre	
<b>Grub, Japanese Beetle</b>		<i>Bt</i> (various products)	see label
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	6 fl oz 10 lb/acre	
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz	

\*Several trade names available. Check label for active ingredient. Always follow label instructions.

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<b>Pests</b>	<b>Insecticide and Formulation</b>	<b>Amount Per 1,000 Square Feet</b>	<b>Comments/Precautions</b>
<b>Grub, Japanese Beetle</b> (cont.)	clothianidin (Arena) 0.25 G, 50 WDG	see label	
	clothianidin + bifenthrin (Aloft)	see label	
	halofenozide* (Grubex, Mach 2) 2 SC 1.5 G	2.9 fl oz 3 lb	Apply during egg hatch or early instar grub development.
	imidacloprid* (Merit) 75 WP	3-4 level tsp	Make application prior to egg hatch. (Offers some suppression of caterpillars.)
	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.
	thiamethoxam (Meridian) 0.33 G 25 WG	60-80 lb/acre 12.7-17.0 oz/acre	Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	trichlorfon* (Dylox 80 SP)	3.75 oz	
<b>Leafhopper, Spittlebug</b>	acephate* (Orthene T, T&O) 75 S	1 oz	
	bifenthrin* (Menace, Talstar, others) F, GC G form also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	deltamethrin (Deltagard) G	2-3 lb	
<b>Millipede</b>	bifenthrin* (Menace, Talstar, others) F, GC G form also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	cypermethrin (Demon) TC	see label	
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.
<b>Mole Cricket</b>	acephate* (Orthene T, T&O, Lesco-Fate) (Precise 4G)	1.0-1.9 oz 2.8 lb	Water soil before application. Do not water in. Apply within two weeks of egg hatch for prevention. Irrigate immediately.
	bifenthrin* (Menace, Talstar, others) F, GC G form also available	0.5-1.0 fl oz	Use GC formulation for golf course.
	carbaryl* baits	see label	
	cyfluthrin* (Tempo 2, Tempo Ultra)	0.2 fl oz	
	deltamethrin (Deltagard) G	2-3 lb	Home lawn use only.
	entomogenous nematodes*	see label	Various formulations now available. Adequate soil moisture critical for good control.
	fipronil (Chipco Choice) 0.1 G (Top Choice) 0.0143	2 lb	Use slit placement equipment. Apply as a broadcast.
	imidacloprid (Merit) 75 WP 0.5G	4 level tsp 1.8 lb	Apply while crickets are less than 1/2 inch long (June, early July).

**COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL**

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<b>Mole Cricket</b>	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Advion) mole cricket bait 0.22%	1.15-4.6 lb	Not for use on sod farms.
	indoxacarb (Provaunt)	0.275 oz	Must be in possession of a supplemental label for this use at the time of application.
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.
<b>Slug, Snail</b>	mesurool 2 B	1 lb	Apply late in afternoon.
	metaldehyde	see label	
<b>Sod Webworm</b>	acephate* (Lesco-Fate, Orthene T, T&O) (Precise 4G)	0.5-1.0 oz 2.8 lb	Home lawns only. Irrigate immediately.
	azadirachtin* (Azatrol, Neemix, Turplex)	0.5 fl oz	
	<i>Bacillus thuringiensis</i> (various brands)	1-2 lb/acre	
	bifenthrin* (Menace, Talstar, others) F, GC and G form also available	0.18-0.25 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	4.4-6.0 fl oz 7.5 to 10 lb/acre	
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label. Watering or mowing of the treated area should be delayed for 12 to 24 hours after treatment.
	clothianidin (Arena) 0.25 G, 50 WDG	see label	
	clothianidin + bifenthrin (Aloft)	see label	
	cyfluthrin* (Tempo 2, Tempo Ultra)	0.143 fl oz	Irrigate immediately after application. Do not apply to newly seeded stands of bentgrass.
	deltamethrin (Deltagard) G	2-3 lb	
	halofenozide (Mach 2) 2 SC 1.5 G	1.5 fl oz 1.0 lb	Can be used two times per season at these rates.
	imidacloprid + bifenthrin (Allectus, Atera)	see label	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Provaunt) WDG	see label	Not labeled for use on sod farms.
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.
	methomyl (Lannate) 90 SP	0.4-0.8 oz	
	permethrin* (Astro)	0.4-0.8 fl oz	
spinosad A and D (Conserve) SC	0.25-1.25 fl oz	Rate varies with size and species.	
trichlorfon* (Dylox, Proxol) 80 SP	1.5-3.0 oz		
<b>Sowbug, Pillbug</b>	bifenthrin* (Talstar) F, GC G form also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3.0 fl oz 2.5-5.0 lb/acre	
	chlorpyrifos* (Dursban Pro)	1.5 fl oz	For use on turfgrasses and golf courses. See new label.
	cypermethrin* (Demon) TC	see label	
	deltamethrin (Deltagard) G	2-3 lb/1,000 ft	
	λ-cyhalothrin* (Battle, Scimitar WP, CS, GC)	see label	Do not make applications within 20 ft of any body of water. No reentry until spray has dried.

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